

WHAT IS CLAIMED IS:

1. An elongated structural chord member comprising in cross-section:
  - a base; and
  - two substantially parallel legs extending in the same direction from the longitudinal edges of said base over the length thereof at a substantially right angle thereto, each of said legs comprising:
    - a first outer face adjacent said base;
    - a web attachment face, the plane of the web attachment face being substantially parallel to the plane of said first outer face;
    - a portion interconnecting said first outer face and said web attachment face, said interconnecting portion extending inwardly at a substantially right angle from the distal edge of said first outer face and outwardly at a substantially right angle from the longitudinal edge of said web attachment face adjacent said base; and
    - a reinforcement flange extending from the distal edge of said web attachment face over a portion of the length thereof, said flange comprising a lateral flange portion extending outwardly at a substantially right angle from the distal edge of said web attachment face and an outer flange face extending toward said base at a substantially right angle from the outer edge of said lateral flange portion, said outer flange face being substantially coplanar with said first outer face.
2. The chord member of Claim 1 wherein the longitudinal width of the legs is

greater than the longitudinal width of the base.

3. The chord member of Claim 1 wherein said reinforcement flange extends from the distal edge of said web attachment face over the length thereof.

4. The chord member of Claim 1 wherein said reinforcement flange terminates at a point spaced from at least one end of said chord member on one of said legs.

5. The chord member of Claim 1 wherein said reinforcement flange terminates at a point spaced from at least one end of said chord member on both of said legs.

6. The chord member of Claim 5 wherein the web attachment faces are apertured between the point of termination of said reinforcement flange and the end of said chord member to thereby facilitate attachment of said chord member to a structural member received between said web attachment faces adjacent the end thereof.

7. The chord member of Claim 1 wherein said web attachment face includes one or more apertured portions along the length thereof.

8. The chord member of Claim 7 wherein said first outer face forms one or more pilot holes along the length of the one or more apertured portions of the web attachment face.

9. A single-piece roll-formed generally U-shaped elongated structural chord member of light gauge metal comprising in cross-section:

a base; and

two substantially parallel legs extending from the longitudinal edges of said base,

each of said legs comprising:

a first outer face adjacent said base along the length thereof;

a second outer face adjacent the distal end of said leg along a portion of the length thereof, said second outer face being substantially coplanar with said first outer face; and

an inwardly recessed web attachment face connected at each end thereof to one of said outer faces along the length thereof by a lateral portion extending outwardly at a substantially right angle from said web attachment face.

10. The chord member of Claim 9 wherein said second outer face and said lateral portion connecting said second outer face with said web attachment face terminate at a point spaced from at least one end of said chord member.

11. The chord member of Claim 10 wherein the web attachment face is apertured between (i) the point of termination of said second outer face and said lateral portion connecting said second outer face with said web attachment face and (ii) the end of said chord member spaced from the point of termination.

12. The chord member of Claim 9 wherein said web attachment member includes one or more apertured portions along the length thereof.

13. The chord member of Claim 9 wherein said first outer face includes one or more apertures for aligning one or more web members received between said web attachment faces.

14. The chord member of Claim 13 wherein the web attachment face includes

an apertured portion adjacent the one or more apertures in said first outer face.

15. The chord member of Claim 9 formed from light gauge metal.

16. The chord member of Claim 9 wherein the distance between said web attachment members is greater than one and one half inches.

17. The chord member of Claim 9 having a portion of one or more elongated web members received between said web attachment faces, one or more of said web members comprising a pair of elongated members, each of said members comprising in cross-section a web and two flanges extending from the longitudinal edges of said web in the same direction at a substantially right angle thereto, one of said flanges extending farther from said web than the other of said flanges, each of said flanges terminating in an inwardly turned lip extending toward the other of the flanges, said members being nested so that the shorter of the flanges of each member is adjacent to and inside of the longer of the flanges of the other member so that the two nested members form a generally box-shaped web member.

18. The chord member of Claim 17 wherein the distance between said web attachment faces is greater than one and one-half inches and the web members are at least two and one-half inches wide.

19. An elongated structural chord member comprising in cross-section:  
a base portion comprising a generally planar base, an outer face extending from each longitudinal edge of said base at a substantially right angle thereto, and a lateral face

extending inwardly from the distal edge of each outer face at substantially a right angle thereto; and

two substantially parallel web attachment faces, each web attachment face extending from an inner edge of one of said lateral faces at a substantially right angle thereto.

20. The chord member of Claim 19 further comprising a reinforcement flange extending from the distal edge of each web attachment face, each of said reinforcement flanges comprising a lateral flange face extending outwardly from the distal edge of said web attachment face at a substantially right angle thereto and an outer flange face extending toward said base from said lateral flange face at a substantially right angle thereto.

21. The chord member of Claim 20 wherein an outer face is substantially coplanar with an outer flange face.

22. A single-piece roll-formed elongated structural chord member comprising in cross-section a base and two substantially parallel legs extending from the longitudinal edges of said base at a substantially right angle thereto, each of said legs comprising a pair of coplanar faces and another of substantially parallel faces, each of said pair of faces being substantially perpendicular to the other of said pair of faces.

23. A single-piece roll-formed elongated structural chord member comprising in cross-section a base and two substantially parallel legs extending from the longitudinal

edges of said base at a substantially right angle thereto, each of said legs comprising a web attachment face and a pair of substantially parallel faces, one of said pair of faces extending laterally from each longitudinal edge of said web attachment face at a substantially right angle thereto and substantially the same distance therefrom.

24. A single-piece roll-formed elongated structural chord member comprising in cross-section eleven faces, each of said faces being either substantially parallel to or substantially perpendicular to the other of said faces, at least two pair of said faces being substantially coplanar and substantially perpendicular to each other.

25. A generally U-shaped elongated structural chord member comprising in cross-section four pair of substantially coplanar faces.

26. A generally U-shaped elongated structural chord member comprising in cross-section at least seven faces, each of said faces being either substantially parallel to or substantially perpendicular to the other of said faces, the U-shaped member in cross section being at least as long as it is wide.

27. The chord member of Claim 26 wherein the number of faces is eleven.

28. The chord member of Claim 26 comprising four pair of substantially coplanar faces.

29. The chord member of Claim 26 wherein each leg of the chord member comprises a pair of substantially coplanar faces and another pair of faces substantially perpendicular to said pair of substantially coplanar faces.

30. A single-piece roll-formed elongated structural chord member of light gauge metal comprising in cross-section a base and two substantially parallel legs extending from the longitudinal edges of said base over the length thereof at a substantially right angle thereto,

each of said legs including first and second coplanar faces at opposite ends thereof and a third face parallel to but inwardly spaced from said coplanar faces; and

a pair of lateral faces interconnecting said third face to said first and second faces, said pair of lateral faces being substantially perpendicular to said first, second and third faces.

31. An elongated structural web member of light gauge metal suitable for use as a load bearing web member in a truss having chord members with greater than a one and one-half inch throat, said web member comprising a pair of elongated members, each of said members comprising in cross-section a web and two flanges extending from the longitudinal edges of said web in the same direction at a substantially right angle thereto, one of said flanges extending farther from said web than the other of said flanges, each of said flanges terminating in an inwardly turned lip extending toward the other of the flanges, said members being nested so that the shorter of the flanges of each member is adjacent to and inside of the longer of the flanges of the other member so that the two nested members form a generally box-shaped web member, wherein the longer of said flanges of each member being more than one and one-half inches long so that said web

member has sufficient load bearing capacity and is adapted to be received within the throat of a truss chord member having a throat width greater than one and one-half inches.

32. The web member of Claim 31 wherein the width of said web member at least two and one-half inches but not greater than fourteen inches.

33. The web member of Claim 31 wherein the ratio of the width of the web member to the length of the longer of said flanges is at least 2 but not greater than seven.

34. The web member of Claim 31 adapted to be securely received within a two inch wide throat of a truss chord member.

35. The web member of Claim 31 wherein each of said members is formed from light gauge metal.

36. An elongated sheet of light gauge metal from which one or more truss chord members may be formed, said sheet comprising along the length thereof one or more apertured portions of reduced width.

37. The sheet of Claim 36 wherein said one or more apertured portions include a grid of apertures comprising two or more rows of spaced apart apertures.

38. The sheet of Claim 37 wherein said grid of apertures is at least six inches long.

39. The sheet of Claim 37 wherein said grid of apertures includes at least twenty spaced apart apertures.



40. A truss comprising:

an elongated upper chord member;

an elongated lower chord member;

and a plurality of interconnecting web members,

said upper or lower chord member being a generally U-shaped elongated structural chord member comprising in cross-section at least seven faces, each of said faces being either substantially parallel to or substantially perpendicular to the other of said faces.

41. The truss of Claim 40 wherein said upper or lower chord member comprises in cross-section:

a base; and

two substantially parallel legs extending from the longitudinal edges of said base, each of said legs comprising:

a first outer face adjacent said base along the length thereof;

a second outer face adjacent the distal end of said leg along a portion of the length thereof, said second outer face being substantially coplanar with said first outer face; and

an inwardly recessed web attachment face connected at each end thereof to one of said outer faces along the length thereof by a lateral portion extending outwardly at a substantially right angle from said web attachment face.

42. The truss of Claim 41 wherein one or more of said web members comprises a pair of elongated members, each of said members comprising in cross-section a web and two flanges extending from the longitudinal edges of said web in the same direction at a substantially right angle thereto, one of said flanges extending farther from said web than the other of said flanges, each of said flanges terminating in an inwardly turned lip extending toward the other of the flanges, said members being nested so that the shorter of the flanges of each member is adjacent to and inside of the longer of the flanges of the other member so that the two nested members form a generally box-shaped web member.

43. The chord member of Claim 42 wherein the distance between said web attachment faces is greater than one and one-half inches and the web members are at least two and one-half inches wide.

44. The truss of Claim 41 wherein said upper and lower chord member comprises in cross-section:

- a base; and

- two substantially parallel legs extending from the longitudinal edges of said base, each of said legs comprising:

- a first outer face adjacent said base along the length thereof;

- a second outer face adjacent the distal end of said leg along a portion of the length thereof, said second outer face being substantially coplanar with said first outer face; and

- an inwardly recessed web attachment face connected at each end thereof to one of

said outer faces along the length thereof by a lateral portion extending outwardly at a substantially right angle from said web attachment face.

45. The truss of Claim 40 wherein said upper or lower chord member comprises in cross-section:

- a base; and

- two substantially parallel legs extending in the same direction from the longitudinal edges of said base over the length thereof at a substantially right angle thereto, each of said legs comprising:

  - a first outer face adjacent said base;

  - a web attachment face, the plane of the web attachment face being substantially parallel to the plane of said first outer face;

  - a portion interconnecting said first outer face and said web attachment face, said interconnecting portion extending inwardly at a substantially right angle from the distal edge of said first outer face and outwardly at a substantially right angle from the longitudinal edge of said web attachment face adjacent said base; and

  - a reinforcement flange extending from the distal edge of said web attachment face over a portion of the length thereof, said flange comprising a lateral flange portion extending outwardly at a substantially right angle from the distal edge of said web attachment face and an outer flange face extending toward said base at a substantially right angle from the outer edge of said lateral flange portion, said outer flange face being

substantially coplanar with said first outer face.

46. The chord member of Claim 45 wherein said reinforcement flange terminates at a point spaced from at least one end of said chord member on one of said legs.

47. The chord member of Claim 45 wherein said reinforcement flange terminates at a point spaced from at least one end of said chord member on both of said legs.

48. The chord member of Claim 47 wherein the web attachment faces are apertured between the point of termination of said reinforcement flange and the end of said chord member to thereby facilitate attachment of said chord member to a structural member received between said web attachment faces adjacent the end thereof.

49. The chord member of Claim 45 wherein said web attachment face includes one or more apertured portions along the length thereof.

50. The chord member of Claim 49 wherein said first outer face forms one or more pilot holes along the length of the one or more apertured portions of the web attachment face.

51. A truss comprising:

an elongated upper chord member;

an elongated lower chord member; and

a plurality of interconnecting web members, one or more of said web members

being an elongated structural load bearing member comprising a pair of elongated members, each of said members comprising in cross-section a web and two flanges extending from the longitudinal edges of said web in the same direction at a substantially right angle thereto, one of said flanges extending farther from said web than the other of said flanges, each of said flanges terminating in an inwardly turned lip extending toward the other of the flanges, said members being nested so that the shorter of the flanges of each member is adjacent to and inside of the longer of the flanges of the other member so that the two nested members form a generally box-shaped web member.

52. The truss of Claim 50 wherein said upper or lower chord member comprises in cross-section:

a base portion comprising a generally planar base, an outer face extending from each longitudinal edge of said base at a substantially right angle thereto, and a lateral face extending inwardly from the distal edge of each outer face at substantially a right angle thereto;

two substantially parallel web attachment faces, each web attachment face extending from an inner edge of one of said lateral faces at a substantially right angle thereto; and

a reinforcement flange extending from the distal edge of each web attachment face, each of said reinforcement flanges comprising a lateral flange face extending outwardly from the distal edge of said web attachment face at a substantially right angle

thereto and an outer flange face extending toward said base from said lateral flange face at a substantially right angle thereto.

53. The truss of Claim 51 wherein the distance between the web attachment faces is greater than one and one-half inches and the length of the longer of said web member flanges is adapted so that a portion of said web members may be attachably received between the web attachment members of said upper or lower chord member.

54. The truss of Claim 50 comprising a pair of upper chord members coupled at the upper ends thereof to form a peak, and each end of said lower chord member being coupled to a lower end of one of said upper chord members.

55. The truss of Claim 54 wherein a portion of the web attachment faces adjacent the upper end of one upper chord member overlies a portion of the web attachment faces adjacent the upper end of the other upper chord member.

56. The truss of Claim 55 wherein the upper end of a substantially vertical web member is received between the overlying web attachment faces of said upper chord members.

57. A method of making a plurality of elongated structural chord members comprising the steps of:

- (a) providing an elongated sheet of light gauge metal;
- (b) forming one or more elongated grids of apertures along the length of the sheet;

(c) forming one or more pilot holes in one or more of the apertured portions of the sheet;

(d) removing portions of the sheet from each elongated edge thereof to thereby form one or more elongated narrowed portions along the length of the sheet;

(e) bending the sheet to form a generally U-shaped elongated structural member; and

(f) transversely cutting the elongated member in each narrowed portion thereof to thereby form a plurality of generally U-shaped elongated structural chord members.

58. The method of Claim 57 wherein the portions removed from the sheet a generally T-shaped.

59. A method of fabricating a truss comprising the steps of:

(a) providing an upper and a lower elongated structural chord member, the chord members comprising in cross-section:

a base portion comprising a generally planar base, an outer face extending from each longitudinal edge of said base at a substantially right angle thereto, and a lateral face extending inwardly from the distal edge of each outer face at substantially a right angle thereto; and

two substantially parallel web attachment faces, each web attachment face extending from an inner edge of one of said lateral faces at a substantially right angle thereto; and

(b) providing a plurality of interconnecting elongated structural web members, the web members comprising a pair of elongated members, each of said members comprising in cross-section a web and two flanges extending from the longitudinal edges of said web in the same direction at a substantially right angle thereto, one of said flanges extending farther from said web than the other of said flanges, each of said flanges terminating in an inwardly turned lip extending toward the other of the flanges, said members being nested so that the shorter of the flanges of each member is adjacent to and inside of the longer of the flanges of the other member so that the two nested members form a generally box-shaped web member; and

(c) positioning and attaching one end of each web member between the web attachment faces of the upper chord member and positioning and attaching the other end of the web members between the web attachment faces of lower chord member.

60. A method of fabricating a truss comprising the steps of:

(a) providing upper and lower elongated structural chord members, each of the chord members having a generally U-shaped cross-section adapted to attachably receive the end portions of elongated structural web members between the legs forming the generally U-shaped cross-section thereof;

(b) providing one or more grids of apertures along the length of the legs of the chord members;

(c) providing one or more pilot holes along the length of the chord member to



thereby facilitate the positioning of web members for attachment to the chord members;

(d) providing a plurality of interconnecting elongated structural web members;

(e) positioning and attaching one end of each web member between the legs of the upper chord member and positioning and attaching the other end of the web members between the legs of lower chord member.

61. The method of Claim 60 wherein a web member is positioned by locating a predetermined pilot hole along the length of the upper or lower chord member, positioning one end portion of the web member between the legs of the chord member adjacent the pilot hole, and attaching the web member to the chord member.

62. The method of Claim 61 wherein the web member is attached to the chord member by one or more screws, each screw being threaded through an apertures in one of the grids of apertures along the length of the legs of the chord member.

63. The method of Claim 60 wherein the chord members comprise in cross-section:

a base portion comprising a generally planar base, an outer face extending from each longitudinal edge of said base at a substantially right angle thereto, and a lateral face extending inwardly from the distal edge of each outer face at substantially a right angle thereto; and

two substantially parallel web attachment faces, each web attachment face extending from an inner edge of one of said lateral faces at a substantially right angle

thereto.

64. The method of Claim 60 wherein the web members comprise a pair of elongated members, each of said members comprising in cross-section a web and two flanges extending from the longitudinal edges of said web in the same direction at a substantially right angle thereto, one of said flanges extending farther from said web than the other of said flanges, each of said flanges terminating in an inwardly turned lip extending toward the other of the flanges, said members being nested so that the shorter of the flanges of each member is adjacent to and inside of the longer of the flanges of the other member so that the two nested members form a generally box-shaped web member.

65. A method of forming the peak of a light gauge metal truss without using a gusset plate comprising the steps of:

- (a) removing the stiffening flanges from the distal end of the legs of a pair of generally U-shaped elongated chord members from the end of the chord members to a point spaced from the end of the chord members;
- (b) positioning the ends of the chord members so that a portion of the legs of one chord member overlies a portion of the legs of the other chord member;
- (c) positioning the end portion of an elongated structural web member between the overlying portions of the legs of the chord members, the web member having sufficient width to gusset the peak formed by the pair of chord members ; and
- (d) attaching the chord members and web member,

the overlying legs of the chord members and the web member thereby providing three overlying thicknesses of light gauge metal on each side of the truss to thereby enhance the structural integrity of the peak with attachment means engaging the three overlying thicknesses of metal.

66. The method of Claim 65 wherein the width of the web member is at least about four inches and not greater than about fourteen inches.

67. The method of Claim 66 wherein the width of the web member is about six inches.

68. A bracket for securing a truss to a base having a generally planar upper surface to thereby provide resistance to uplifting forces exerted on the truss surface, said bracket comprising a pair of substantially perpendicular attachment faces interconnected by a pair of substantially perpendicular chord engaging faces, one of said attachment faces being adapted to overlie a substantially vertical web attachment face of a truss chord member for attachment thereto, the other of said attachment faces being adapted to overlie the generally planar upper surface of said base for attachment thereto.

69. A bracket for mutually securing a first truss and a second truss abutting said first truss, said bracket comprising:

a first back plate adapted to overlie the leg of a portion of a chord member of a first truss adjacent an abutting truss;

a second back plate extending laterally from the abutting truss side of the first back

plate, said second back plate being adapted to overlie the leg of a portion of a chord member of said abutting truss adjacent said first truss;

a first attachment portion extending from the upper edge of said first back plate, said first attachment portion having a minor portion extending outward from said first back plate and a major portion substantially parallel to said first back plate, said major portion being adapted to overlie a portion of a web member of said first truss for attachment thereto; and

a second attachment portion extending from the upper edge of said second back plate, said second attachment portion having a minor portion extending outward from said second back plate and a major portion substantially parallel to said second back plate, said major portion being adapted to overlie a portion of a web member of said abutting truss for attachment thereto.

70. The bracket of Claim 69 wherein said second back plate is substantially perpendicular to said first back plate.

71. The bracket of Claim 69 wherein said second back plate extends at an oblique angle from said first back plate.